

REMARKS

INTRODUCTION

In accordance with the foregoing, claims 1 and 6 have been amended and claims 11-16 have been added. Claims 1-10 are pending and under consideration. No new matter is being presented, and approval and entry are respectfully requested.

CLAIM REJECTIONS – 35 USC 112

At paragraph 1, claims 1-10 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. This rejection is traversed.

The present invention provides a numerical controller capable of controlling the relative position of a workpiece and a tool in synchronization with a reference rotational axis, to which the workpiece or the tool is attached, without causing time delay of the position control of the tool especially in variation of a rotational velocity of the reference axis. The first five paragraphs of the detailed description describe the components of the numerical controller. The remainder of the detailed description shows how the unique arrangement of the components of the numerical controller function, including equations, so that the tool is moved relative to the workpiece in synchronism with the rotary motion of the workpiece to perform the machining operation. The designating means for designating data of a rotational position and a rotational velocity of the workpiece, and data of a position of the tool relative to the workpiece is described at least in the first through fifth paragraphs of the sixth page of the application.

CLAIM REJECTIONS – 35 USC 102

At paragraph 2, claims 1-10 were rejected under 35 U.S.C. 102(b) as being anticipated by Kawamura et al. (U.S. Patent No. 4,970,449) (hereinafter "Kawamura"). This rejection is traversed.

Kawamura discloses a numerical control apparatus for controlling the controlled axis of a workpiece rotating shaft in a cylindrical grinder or a three-axis lathe. Kawamura, column 1, lines 5-8. The numerical controller disclosed in Kawamura, includes a part program 1 formed as a position command signal by the decoding processor 2 and pulse distribution processor 3. An

axis control processor 61 outputs a position command signal, velocity command signal and mode setting signal to a servo-control processor 71 of digital servo construction. The servo-control processor 71 has circuitry for controlling the position, velocity and current of the servomotor 9 and controls the rotational velocity and position of a spindle motor and controlled-axis motor by applying a current command to velocity amplifier 81. Kawamura, column 3, lines 12-22.

Claims 1-5

Claim 1 recites: "...controlling the rotational position and the rotational velocity of the workpiece and the position of the tool relative to the workpiece based on the data designated by said designating means." In contrast to claim 1, Kawamura discloses a numerical controller for controlling the position, velocity and current of a servomotor and controlling the rotational velocity and position of a spindle motor and controlled-axis motor. Kawamura does not disclose a numerical controller controlling the position of the workpiece and the position of the tool relative to the workpiece as is recited in claim 1. In Kawamura, a numerical control apparatus for controlling a machine tool employing a servomotor for rotating a spindle is disclosed. The control is switched between an arrangement in which the servomotor is used to serve as a spindle motor for controlling rotational velocity of the spindle and an arrangement in which the servomotor is used to serve as a C-axis motor for controlling the position of the spindle. This is in contrast to claim 1 where data of a rotational position and rotational velocity of the workpiece and data of a position of the tool relative to the workpiece corresponding to the data of the rotational position of the workpiece are designated in advance, and the position of the tool relative to the workpiece is controlled to be synchronized with the rotational position and velocity of the workpiece without time delay based on the designated data.

Claims 2-5 are dependent on claim 1 and are therefore believed to be allowable for the reasons discussed above.

Withdrawal of the foregoing rejection is requested.

Claims 6-10

Claim 6 recites: "...controlling the rotational position and the rotational velocity of the workpiece and the position of the tool relative to the workpiece based on the data designated by said designating means." In contrast to claim 6, Kawamura discloses a numerical controller for

controlling the controlled axis of a workpiece rotating shaft. Kawamura does not disclose a numerical controller controlling the position of the tool relative to the workpiece as is recited in claim 6. In Kawamura, a numerical control apparatus for controlling a machine tool employing a servomotor for rotating a spindle is disclosed. The control is switched between an arrangement in which the servomotor is used to serve as a spindle motor for controlling rotational velocity of the spindle and an arrangement in which the servomotor is used to serve as a C-axis motor for controlling the position of the spindle. This is in contrast to claim 6 where data of a rotational position and rotational velocity of the workpiece and data of a position of the tool relative to the workpiece corresponding to the data of the rotational position of the workpiece are designated in advance, and the position of the tool relative to the workpiece is controlled to be synchronized with the rotational position and velocity of the workpiece without time delay based on the designated data.

Claims 7-10 are dependent on claim 6 and are therefore believed to be allowable for the reasons discussed above.

Withdrawal of the foregoing rejection is requested.

NEW CLAIMS

Claims 11-16 have been added to recite additional features of the invention. No new matter has been added.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: _____

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By: _____

John C. Garvey
Registration No. 28,607

1201 New York Avenue, NW, Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501